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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)
oracle01.028

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Application Number	Filed
10/810756	3/26/2004

First Named Inventor	
Hu, et al.,	

Art Unit	Examiner
2161	Ahluwalia, Navneet K.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☑ attorney or agent of record. Registration number 30,093
- ☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

/Gordon E. Nelson/
Signature

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4/15/2009
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(oracle01.028)

Applicant:	Ying Hu et al.	**Confirmation No.:**	9081
Application No:	10/810,756	**Group Art Unit:**	2166
Filed:	3/26/04	**Examiner:**	Ahluwalia, Navneet K.

Title: *A database management system with persistent, user-accessible bit map values*

Commissioner for Patents
Alexandria, VA 22313-1450

Brief for a pre-appeal brief conference

Status of the prosecution

This is the second pre-appeal brief conference in this application. The first conference resulted in a reopening of prosecution and a non-final Office action issued July 2, 2008 in which Examiner rejected all claims under 35 U.S.C. 102(e) as anticipated by a new reference, U.S. Patent 6,633,883, Elie Koskas, *Methods of organizing data and processing queries in a database system and database system and software product for implementing such methods* (henceforth "Koskas") and rejected all claims as directed to non-statutory subject matter under 35 U.S.C. 101. In a response filed October 2, 2008, Applicants amended claim 1 to overcome the rejection of claims 1-21 under 35 U.S.C. 101. Applicants traversed the remaining rejections, namely the rejections under 35 U.S.C. 102 and the rejections of claims 22-47 under 35 U.S.C. 101. Examiner maintained her rejections in a final Office action issued 12/15/2008. Applicants are now responding with a Request for a Pre-Appeal Brief Conference and the following *Brief*. In the *Brief*, locations in Applicants' Specification are cited using the paragraph numbers from the published application, which bears the publication number US 2005/0216518

What Applicants are claiming

As set forth in Applicants' *Abstract*, Applicants' inventions concern techniques for making bitmap values in database systems more useful than they presently are. Bitmap values have long been used in the bitmap indexes which database systems provide to users, but users of database systems which employed bitmap indexes could do no more than specify that the database system

make a bitmap index for a field of a table or drop such an index. All of the operations necessary to create, maintain, use, and delete the bitmap indexes were automatically performed by the database system. See [0017]-[0020] of US 2005/0216518.

In Applicants' inventions, by contrast, the user can directly define and manipulate bit-map values that represent sets of objects whose definitions are built into the database system. An example of such objects is row identifiers. An example of what is meant by "the user can directly define and manipulate" such bitmap values is the following SQL query at [0173] of Applicants' Specification:

```
SELECT resume FROM ResumeTable
WHERE rowid IN BITMAP2ROWIDS(BITMAP_AND(
(SELECT TermIndex FROM ResumeIndexTable WHERE
      SearchTerm = "Massachusetts Institute of
      Technology"),
 (SELECT TermIndex FROM   ResumeIndexTable WHERE
      SearchTerm = "PL/SQL")));
```

As shown in FIG. 1 and set forth in detail at [0164]-[0174], ResumeTable is a table whose rows include the text of resumes. The query returns resumes from ResumeTable that contain both "Massachusetts Institute of Technology" and "PL/SQL". ResumeIndexTable is a table of user-defined bit map indexes for terms which appear in the resumes of ResumeTable. ResumeIndexTable 115 has two columns: SearchTerm and TermIndex. There is a row for each term of interest. In a row, SeachTerm contains the row's term and TermIndex contains a bitmap index of the rows of ResumeTable 103 which contain resumes that have the term. Reading the query from the bottom, the first SELECT TermIndex clause return a bitmap indicating rows of ResumeTable with resumes that contain PL/SQL and the second SELECT TermIndex clause returns a bitmap indicating rows with resumes that contain "Massachusetts Institute of Technology". The built-in BITMAP_AND operator ANDs the two bitmaps. The AND is of course a bitmap which indicates rows of ResumeTable whose resumes contain both search terms. The built-in BITMAP2ROWIDS operator converts the bitmap resulting from the AND operation to the set of rowids indicated by the bitmap. Those rowids then determine the rows from which resumes are selected by the query's WHERE clause.

Claim 1 as amended in Applicants' response of October 2, 2008 sets forth one aspect of the invention:

> 1. (currently amended) A database management system including a processor and persistent storage, the processor executing code for the database management system and the persistent storage containing database objects that are manipulated by the processor when executing the code for the database management system, the data base management system having the improvement comprising:
>
> database objects in the persistent storage that are bitmap values, a bitmap value having a representation of a bitstring wherein set bits specify a set of the database objects whose definitions are built into the database management system, and
>
> bitmap operations implemented in the code for the database management system, a bitmap operation having a user-specified operand which is a bitmap value and/or a set of objects.

In the query of [0173], the TermIndex fields embody the claim's "database objects in the persistent storage that are bitmap values"; the claim's "bitmap operations" are embodied in the BITMAP_AND and BITMAP2ROWIDS operations; as can be seen from the query, the operations have "a user-specified operand which is a bitmap value and/or a set of objects".

The disclosure of Koskas

Koskas discloses a relational database system that responds to standard SQL queries (col. 31, line 61-col. 32, line 13). However, the internal representation of the data in the database system is different from that used in most RDBMS's. As set forth at col. 18, line 55 through col. 20, line 19, Koskas discloses a database system in which the data to be stored in the database system is first organized as a flat file having rows and columns (FIG. 8) and the flat file is then used to make a virtual data graph (VDG) in which the values in each column of the flat file are represented by one or more word thesauruses (FIG. 10A-H). For a given value belonging to a given column, the word thesaurus for the value indicates the rows in the flat file in which the given column has the given value. One way in which the rows which have the given value in the given column are specified is a bitmap value. The bitmap has a bit for every row of the flat file. When the given value is present in the given row, the bitmap value for the given column so indicates. Where there are large numbers of different values in a given column, the word thesauruses may be organized into hierarchies of macroword thesauruses.

Once the data has been organized as just described in Koskas' database, it may be queried using standard SQL. As described at col. 10, line 57-col. 11, line 20, in executing an SQL query,

Koskas' system can use Boolean operations on the thesauruses' bitmap values to locate all of the rows of the flat file which contain values that satisfy a query. There is absolutely nothing in Koskas' disclosure that compares to Applicants' query of [0173] and indeed nothing anywhere in Koskas to indicate that a *user* of the system has any access whatever to primitive operations on the bitmap values of the thesauruses. Koskas, though exceedingly complex, is thus just another example of the prior art's use internally to a database system of bitmaps, bitmap values, and operations on the bit map values to speed up the operation of a database system. Because that is the case, Koskas does not anticipate claim 1 or any other of Applicants' claims.

The rejections of claims 22 and 44 under 35 U.S.C. 101

Both of these claims are directed to "a bitmap value employed in a database management system" and have been rejected as directed to a "number/data structure", and consequently not directed to statutory subject matter. Claim 22 is exemplary:

> **22.** (previously presented) A bitmap value employed in a database management system, the bitmap value representing a first subset of a second subset of objects that are defined in the database management system, and
> the bitmap value comprising:
> a mapping specifier that maps a string of bits to the second subset; and
> a representation of the string of bits wherein a bit is set in the represented string of bits when the member of the second subset that is mapped to the bit belongs to the first subset and the database management system providing at least a first operation which permits users of the database system to specify the mapping of the string of bits to the second subset and a second operation which permits users to directly specify setting bits of the string of bits that correspond to the first subset.

The first theory under which Examiner rejects the claim is that it is addressed to a "number". Examiner does not cite any law for the proposition that a representation of a number used in a computer system is not statutory subject matter, but even if such law existed, a bitmap value that represents a set of objects is not a "number", so that portion of the rejection is without foundation.

The second theory is that the claim is addressed to a "data structure". The portion of the MPEP which addresses the issue of when a claim to a "data structure" is directed to patentable subject matter is 2106.01, at page 2100-17 in MPEP Rev. 6, Sept. 2007. As set forth there, a data structure is "functional descriptive material". As such it is nonstatutory when claimed *per se*. MPEP 2106.01 then goes on to state: "When functional descriptive material is recorded on

some computer readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized". In claim 22, the bitmap value is "employed in a database management system". As is well known in the art, and shown in FIGs. 1 and 7, values that are "employed in a database management system" are stored in memory devices and operated on by the database management system; further, the bitmap value of the claim represents "a first subset of a second subset of objects that are defined in the database management system", that is, the claimed bitmap value's meaning is determined by the database management system; finally, the database management system of the claim

> provid[es] at least a first operation which permits users of the database system to specify the mapping of the string of bits to the second subset and a second operation which permits users to directly specify setting bits of the string of bits that correspond to the first subset

Clearly, the "bitmap value" of claim 22 is claimed in such a way that "use of technology permits the function of the descriptive material to be realized" and the claim is consequently directed to patentable subject matter. Exactly the same argument may be made with regard to claim 44. Examiner's rejection of Applicants' claims under 35 U.S.C. 101 is consequently without foundation.

Conclusion

Applicants have demonstrated that Koskas does not anticipate any of Applicants' claims and that claims 22 and 44 are directed to statutory subject matter. That being the case, Applicants respectfully request that the Conferees either allow the claims or reopen prosecution. A *Notice of Appeal* and the requisite fee, as well as a one month extension of time and the requisite fee therefor accompany this *Brief*. Please charge any additional fees or refund any overpayments to deposit account number 501315.

Respectfully submitted,

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